

Add new claim 4:

4. The separation finger of claim 3, wherein said surfaces when worn to 50 μm retain the water-repelling angles of at least 90 degrees .

REMARKS

Specification:

Please find attached herewith a specification spaced in accordance with 37 CFR §1.52 (b)(i), such that pages 1-8 (now pages 1-12), as well as the remainder of the application are easier to read and contain adequate space for amendment entry.

A typographical error on page 3, line 21 (WO 00/07074) has been corrected on page 5, line 2 of the substitute specification. (The "weight and 5 to 20 in average particle size" has been corrected to include the units – "weight and 5 to 20 μm in average particle size".) Support is found throughout the specification for this correction, e.g. page 4, line 10 of WO 00/ 07074.

A typographical error on page 4, lines 11 and 12 (WO 00/07074) shows "C" behind the degree symbol as the angle measurement unit. It is understood that angles are measured in degrees as shown by Table –3 on page 7 (WO 00/07074) . Thus, lines 5 and 6, on page 6 of the substitute specification, remove the "°C" and replace it with the spelling of "degrees" for clarity.

Abstract:

Do not see
This specification came to the USPTO via a PCT filing. The abstract filed with the PCT that appears on the front page of the PCT publication WO 00/07074 is on separate page 14 of the substitute specification in accordance with 37 CFR §1.52 (b)(4).

Objections:

Claims 1-3 are objected to as being crowded to close together. The claims have been spaced as requested on page 13 of the substitute specification attached herewith.

35 USC § 112

Claims 1-3 stand rejected under 35 USC 112 second paragraph as indefinite for failing to particularly point out and distinctly claim the subject matter of the invention.

Claim 1 has been amended to remove "characterized" which the examiner considered indefinite.

Applicants believe the examiner intended to reference claim "2" rather than claim "9" on page 2 of the March 14, 2002 Office Action. If the Applicants' assumption is incorrect, Applicants would be happy to respond appropriately upon clarification by the Examiner. Claim 2 has been amended to remove the indefinite objection and disclose the "tip diameter" as referenced on page 3, lines 31- 36 of WO 00/07074.

In claim 3, the use of "C" as a measure of the angle is an unintended typographical error. Claim 3 has been amended to replace "° C" with "degrees". It is understood that angles are measured in degrees as shown by Table -3 on page 7 (WO 00/07074. The portion of claim 3 dealing with the worn surface has been made new dependent claim 4 for clarity and thus does not contain new matter. The process limitation of wear of the separation finger surface to 50µm occurs due to conditions such a friction form non toner and paper dust. (Reference lines 27 – 29, page 1 and page 4, lines 11-13 (WO 00/07074)).

The above amendments are believed to have placed the claims into condition for allowance relative to the above objections. Reconsideration and allowance of these claims is respectfully requested.

35 USC § 103(a):

Claims 1-3 are rejected as being unpatentable over JP 04102883 (JP'883) and U.S. 4,687,696 (Satoji). Claims 1-3 have been amended and new claim 4 added. The Examiner applies JP '883 for its disclosure of a separating pawl for a copying machine, being formed by compression-molding a composition containing 40 to 90 wt% polyimide resin and 60 to 10 wt% polytetrafluoroethylene (PTFE), the mold being sintered. The Examiner concludes that JP'883 differs from the presently claimed invention by not expressly disclosing the weight average molecular weight of the present invention. Satoji is then combined, by the examiner, with JP'883, for its disclosure of the average molecular weight and average particle size of PTFE and water-repelling angle of the surface of the separation finger for use in Electro photographic devices. However, Satoji does not disclose the weight average molecular weight range of the present invention by the Examiner's admission.

Comb Applicants respectfully submit that no suggestion or motivation can be found in *DS* the cited references for combining the prior art as suggested by the Examiner. More specifically, Satoji does not disclose or suggest a finger strip for copying machines being formed of a blend of polyimide and polytetrafluoroethylene resin powders with compression-molding and sintering processes, as in the present invention. Instead Satoji discloses the finger strip made of a heat-resistant resin, which has at least a tip portion coated to a thickness of about 40 angstroms to 1 microns with a fluorinated polyether polymer. This differs from the teachings of the present invention which provides a separation finger having its tip diameters being 50 μm or less because of no fluorinated polyether polymer coating thereto, (see lines 31 to 36, page 3). The separating pawl of JP '883 also differs from the above mentioned teachings of the present invention including the lack of disclosure of the weight average molecular weight.

Furthermore, assuming aground, that the references were considered a logical and appropriate combination by those of ordinary skill in the art, the claimed invention would not have been obvious therefrom. This is due in part to the concept that PTFE of the instant invention having weight-average molecular weight in the ranged of 500,000 to 1,000,000 and average particle size in the range of 5 to 20 μm is not used for its conventional properties, as the fluorinated polyether polymer coating to a tip of a finger strip for a copying machine. And, as pointed out in the instant invention (page 5, Table -1; page 6, Table -2; and page 7, Table-3) when the separation finger obtained by compression-molding and sintering a separation finger of polyimide resin powder and PTFE resin powder having weight-average molecular weight and average particle size outside respective ranges recited in claims, no separation finger having a smooth surface obtained, excellent tip strength, higher water repellency of the surface of the separation finger, i.e., improved non-adhesion of toner and retaining outstanding non-adhesion of toner even when its surface is worn to 50 μm can be obtained. In marked contrast, in the instant invention these unexpected performances are attained due to the use of the blend of such PTFE with polyamide with compression-molding and sintering for molding separation finger for Electro photographic devices.) *int use*

Therefore, it is submitted that Claims 1 and claims 2-4 dependent therefrom, as amended, are patentably distinct from the cited references, and thus in condition for allowance.

In view of the foregoing, allowance of the above-referenced application is respectfully requested.

Respectfully submitted,

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

In showing the changes, deleted material is shown as bracketed, and inserted material is shown underlined.

IN THE SPECIFICATION:

Replace page 3, lines 16-30 (WO 00/07074) as follows:

In this invention, graphite can be blended, along with the polytetrafluoroethylene resin powder, into the polyimide resin powder to the extent that it will not affect the separation finger's performance capability. The separation finger of this invention is obtained by blending polyimide resin powder and polytetrafluoroethylene resin powder, 500,000 to 1,000,000 in weight-average molecular weight and 5 to 20 μ m in average particle size, at a weight-based ratio of 70:30 to 95:5, and then sintering the compound. The polyimide resin and polytetrafluoroethylene resin (PTFE) powders are dry-blended. The blending must be accomplished under a set of conditions that will not cause excessive working of the polyimide resin powder. The compression-molding is normally done at a compression surface pressure of at least 40,000 psi, and the sintering is normally done at a temperature of 380 to 500°C for four hours or longer to achieve complete conversion to polyimide. It is preferable to wash and barrel-grind (tumble) the material with an abrasive media after sintering so that the separation fingers have a smoother surface.

Replace page 4, lines 7- 17 (WO 00/07074) as follows:

The water-repelling angle of the surface of a separation finger obtained by compression-molding and sintering a blend obtained by blending polyimide resin powder and polytetrafluoroethylene resin powder, 500,000 to 1,000,000 in weight-average molecular weight and 5 to 20 μ m in average particle size, at a weight-based ratio of 70:30 to 95:5 is at least [100°C] 100 degrees, and the separation finger's surface retains a water-repelling angle of at least [90°C] 90 degrees even when it has worn to 50 μ m. When a fluororesin is coated over a separation finger, the coat thickness is 30 to 50 μ m. By contrast, in the case of the separation fingers of this invention, the finger surface not only has non-adhesion of toner without requiring coating, but also retains non-adhesion of toner even when the surface layer has worn, and thus is more durable than a coated separating finger.

IN THE CLAIMS:

1. (Amended) A separation finger for Electro photographic devices, being formed by compression-molding a blend of polyimide resin powder and polytetrafluoroethylene resin [powders] powder into the separation finger, followed by sintering the [blend] separation finger, wherein the blend comprises [characterized by the] a weight-based blending ratio of said polyimide resin powders and polytetrafluoroethylene resin powders being 70:30 to 95:5 and said polytetrafluoroethylene resin powder being 500,000 to 1,000,000 in weight-average molecular weight and 5 to 20 μ m in average particle size.

2. (Amended) The separation finger of Claim 1 having a tip diameter of [wherein diameters of tips are] 50 μ m or less.

3. (Amended) The separation finger of Claim 1 or 2 wherein the water-repelling angles of the surfaces of the separation finger are at least 100 [$^{\circ}$ C] degrees [or more and such surface water-repelling angles being at least 90 $^{\circ}$ C even when the surface of the separation finger have worn to 50 μ m].

4 (new) The separation finger of claim 3, wherein said surfaces when worn to 50 μ m retain the water-repelling angles of at least 90 degrees .